UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,380	02/10/2004	Ilya M. Fishman	03-01US	9946

7590 05/16/2007

Bella Fishman
FISHMAN CONSULTING
558 Cambridge Avenue
Palo Alto, CA 94306

EXAMINER	
TAYONG, HELENE E	
ART UNIT	**PAPER NUMBER**
2609	

MAIL DATE	DELIVERY MODE
05/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/775,380	FISHMAN, ILYA M.	
	Examiner	Art Unit	
	Helene Tayong	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Sampath (US 7149254 B2)

(1) With regards to claim 1;

Sampath discloses in fig. 5 a method for preprocessing transmit signals comprising:

propagating a reference signal from a receiver site via one twisted pair of said plurality for obtaining a wavefront of PCV reference signal at a transmitter site (col. 11, lines 47-50).

establishing PCV antenna bundle for each twisted pair of said plurality (col. 11, lines 51-54)

scaling input transmission signals by said PCV reference signal for obtaining mutually coherent PCV transmission signals (col.12, lines 10-14); and

propagating said mutually coherent PCV transmission signals via said PCV antenna bundles for receiving only one signal in a corresponding twisted pair at the receiver site(col.12, lines 15-18).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2-5 and 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sampath (US 7149254 B2) in view of Miyoshi et al (US 6965649 B1)

(1) With regards to claim 2;

Sampath discloses all of subject matter as described above except for specifically teaching measuring a propagation time of said reference signal via said twisted pairs.

However, Miyoshi et al in the same field of endeavor, teaches measuring a propagation time of said reference signal via said twisted pairs (col. 10, lines 5-14).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a propagation time of said reference signal via said twisted pairs of Miyoshi et al to the method of Sampath in order to reduce delay. The motivation to add Miyoshi et al's propagation time to Sampath's method was for synchronization with the transmission system.

(2) With regards to claim 3;

Sampath discloses all of subject matter as described above except for specifically teaching a number of the twisted pairs carrying said PCV reference signals above a predetermined power level defined by crosstalk tolerance.

However, Miyoshi et al in the same field of endeavor, teaches a number of the twisted pairs carrying said PCV reference signals above a predetermined power level defined by crosstalk tolerance (col. 11, lines 7-14).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a number of the twisted pairs carrying said PCV reference signals above a predetermined power level defined by crosstalk tolerance of Miyoshi et al to the method of Sampath in order to provide a transmission system capable of performing a countermeasure against TCM cross-talk. The motivation to add Miyoshi et al's number of the twisted pairs carrying said PCV reference signals above a predetermined power level defined by crosstalk tolerance to Sampath's method was to provide a transmission system which can communicate at a most suitable transmission speed.

(3) With regards to claim 4;

Sampath discloses all of subject matter as described above except for specifically teaching wherein the propagation time of said reference signal does not exceed a shortest wavelength period in any said twisted pair.

However, Miyoshi et al in the same field of endeavor, teaches wherein the propagation time of said reference signal does not exceed a shortest wavelength period in any said twisted pair (col. 10, lines 22-33).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a number of the twisted pairs carrying said PCV reference signals above a predetermined power level defined by crosstalk tolerance of Miyoshi et

al to the method of Sampath in order to provide a transmission system capable of performing a countermeasure against TCM cross-talk. The motivation to add Miyoshi et al's propagation time of said reference signal does not exceed a shortest wavelength period in any said twisted pair to Sampath's method was to provide a transmission system which can communicate at a most suitable transmission speed.

(4) With regards to claim 5;

Sampath discloses all of subject matter as described above except for specifically teaching wherein the propagation time of said reference signal exceeds a shortest wavelength period in any said twisted pair

However, Miyoshi et al in the same field of endeavor, teaches wherein the propagation time of said reference signal exceeds a shortest wavelength period in any said twisted pair (col. 10, lines 22-33).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a number of the twisted pairs carrying said PCV reference signals above a predetermined power level defined by crosstalk tolerance of Miyoshi et al to the method of Sampath in order to provide a transmission system capable of performing a countermeasure against TCM cross-talk. The motivation to add Miyoshi et al's propagation time of said reference signal does not exceed a shortest wavelength period in any said twisted pair to Sampath's method was to improve modulation and demodulation system in a transmission system.

(5) With regards to claim 8;

(a) Sampath discloses all of subject matter as described above except for specifically teaching identifying the telephone cable as a non-uniform physical media;

However, Miyoshi et al in the same field of endeavor, teaches identifying the telephone cable as a non-uniform physical media (Col. 1, lines 21-28);

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add identifying the telephone cable as a non-uniform physical media of Miyoshi et al to the method of Sampath in order to provide a transmission system capable of performing a countermeasure against TCM cross-talk. The motivation to add Miyoshi et al's identifying the telephone cable as a non-uniform physical media to Sampath's method was to improve modulation and demodulation system in a transmission system.

(b) Sampath further discloses introducing phase conjugation vectoring (PCV) by propagating one reference signal via one twisted pair of said plurality from the receiver site to the transmitter site (col. 11, lines 47-50), wherein a diverged front of electromagnetic wave presenting said one reference signal is reversed back to the transmitter site to said one twisted pair (fig. 5, FDD, FEEDBACK col. 11, lines 49-50);

(c) Sampath further discloses forming a bundle for each twisted pair of said plurality for providing a corresponding phase conjugated vectoring antenna (col. 11, lines 52-54);

(d) Sampath further discloses scaling an input signal by the corresponding reversed reference signal for obtaining scaling parameters of mutually coherent transmission signals (col. 12, lines 10-14);

(e) Sampath further discloses propagating simultaneously said mutually coherent transmission signals from the transmitter site via said PCV antenna bundle for obtaining one receiving signal in one said twisted pair at the receiver site (col. 11, lines 47-50);

(6) With regards to claim 9;

Sampath as modified by Miyoshi et al further discloses measuring a propagation time of the reference signal via said twisted pairs (col.9, lines 32-37).

(7) With regards to claim 10;

Sampath as modified by Miyoshi et al further discloses propagation time of any said reference signal does not exceed a shortest wavelength period of a respective electromagnetic wave propagating in any said twisted pair (col. 10, lines 22-35).

(8) With regards to claim 11;

Sampath as modified by Miyoshi et al further discloses propagation time of any said reference signal exceeds a shortest wavelength period of a respective electromagnetic wave propagating in any said twisted pair (col. 10, lines 22-35).

(9) With regards to claim 12;

Sampath as modified by Miyoshi et al further discloses propagating a plurality of mutually coherent reference signals from the receiver site (col. 11, lines 47-50); measuring distribution of amplitudes and phases of said reference signals at the transmitter site (col. 11, lines 47-50); obtaining reconstructing parameters for each twisted pair (col. 11, lines 52-53); and scaling the input signal from the transmitter site by said scaling and reconstructing parameters to corresponding reversed reference signal(col. 12, lines 10-14); and applying said scaled and reconstructed signals to the

respective PCV antennas for obtaining one receiving signal in one said twisted pair at the receiver site (col. 9, lines 15-18).

5. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sampath (US 7149254 B2), Miyoshi et al (US 6965649 B1) as applied to claim 5 and further in view of Cioffi (US 5887032).

(1) With regards to claim 6;

Sampath discloses propagating a plurality of mutually coherent reference signals from the receiver site (col. 11, lines 47-50);

Miyoshi et al further discloses measuring time delay between all twisted pairs of said plurality (col. 9, lines 34-39), defining reconstructing parameters by introducing phase delay and amplitude variations between the respective transmission signals at the transmitter site to obtain a plane wavefront at the receiver site (col.9, lines 39-46);

Therefore, Sampath as modified by Miyoshi et al discloses all of subject matter as described above except for specifically teaching storing reconstructing parameters in a system memory.

However, Cioffi in the same field of endeavor, teaches storing reconstructing parameters in a system memory (col. 10, lines 19-20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the memory of Cioffi to the system of Miyoshi et al as modified by in order to store the bitmaps. The motivation to add Cioffi's storage to Sampath as modified by Miyoshi et al system is to reduce cost problem.

(2) With regards to claim 7;

Sampath further discloses scaling each said respective transmission signal propagating from the transmitter site by corresponding reconstructing and scaling parameters and funneling each said signal to the PCV antenna bundle (Col. 12, lines 10-14).

6. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyoshi et al (US 6965649 B1) in view of Cioffi (US 5887032),

(1) With regards to claim 13;

Miyoshi et al discloses a system (fig. 1A and 1B), reference clock signal generating unit (1) , an encoder (20), Inverse Fourier Transform unit (IFFT)(30), a FFT (130) Parallel-to-serial converter (P/S) (10, 40, 120,150) of crosstalk free transmission of signals via a plurality of twisted pairs of a telephone cable between a transmitter (central office, col. 8, lines 52-67 and col. 9, lines 1-6) and a receiver sites(remote terminal col. 9, lines 7-18), comprising:

Miyoshi et al discloses all of the subject matter disclosed above except for specifically teaching;

a combining units for collecting signals from a respective PCV antenna bundle;

a processing unit coupled with each said combining unit for providing parameters for the PCV antenna bundles for each said twisted pair; and

a PCV components bank coupled to said processing unit for storing parameters of each said PCV antenna, wherein the crosstalk free transmission is provided by scaling input signals to corresponding reversed reference signals and applying scaled signals to the respective PCV antenna bundles.

a crosstalk cancellation unit and

However, Coiffi in the same field of endeavor, teaches combining units for collecting signals from a respective PCV antenna bundle (fig. 4, 402);

a processing unit (fig. 3, 302) coupled with each said combining unit for providing parameters for the PCV antenna bundles for each said twisted pair; and

a PCV components bank (fig. 4, 408)coupled to said processing unit for storing parameters of each said PCV antenna, wherein the crosstalk free transmission is provided by scaling input signals to corresponding reversed reference signals and applying scaled signals to the respective PCV antenna bundles (col. 11, lines 18-25).

a crosstalk cancellation unit (fig. 4, 412)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the components of Coiffi to the system of Miyoshi et al in order to reduce the processing needed to implement NEXT cancellers. The motivation to combine Coiffi's method to Miyoshi et al system would be to provide improved technique to mitigate crosstalk interference (col. 9, lines (30-31)

(2) With regards to claim 14;

Miyoshi et al further discloses a buffer/encoder (20) for encoding a transmission input data (col.8, lines 59-61), IFFT unit connected (30) to said buffer/encoder via said combining unit for obtaining Fourier transformed analog data (col.8, lines 63-65); and

parallel-to-serial converter (40) connected to said IFFT unit for conversion of analog data into a waveform transmitted in the respective twisted pair(col.8, lines 66-67).

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyoshi et al, Cioffi (US 5887032) and Sands et al as applied to claim 14 and further in view of Amrany et al (US 6999504 B1).

(1) With regards to claim 15;

Miyoshi et al as modified by Cioffi further discloses all of the subject matter disclose above, but does not teach transmission input data is propagated from the transmitter site to the receiver site.

However, Amrany in the same field of endeavor, teaches wherein the transmission input data is propagated from the transmitter site to the receiver site (fig. 2A, col. 6, lines 38-44).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the teaching of Amrany to the system of Miyoshi et al as modified by Cioffi in order to approximate the transmitted signal. The motivation to implement Amrany's method was to provide more accurate computation results.

8. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyoshi et al (US 6965649 B1) and Cioffi (US 5887032) as applied to claim 13 and further in view of Sands et al (US 6134283).

(1) With regards to claim 16;

Miyoshi et al as modified by Cioffi discloses all of the subject matter above, except for specifically teaching a second buffer/encoders for encoding a transmission input data.

However, Sands et al in the same endeavor teaches second buffer/encoders for encoding a transmission input data (fig. 11, 1128, 1106).

It would have been obvious to one of ordinary skill at the time the invention was made to integrate the encoder of Sands et al. to the system of Miyoshi et al as modified by Cioffi in order to improve synchronization techniques utilizing crosstalk interference levels. The motivation to integrate Sands et al's device to Miyoshi et al as modified Cioffi's system improve data transmission.

9. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyoshi et al, Cioffi (US 5887032) and Sands et al as applied to claim 16 and further in view of Amrany et al (US 6999504 B1).

(1) With regards to claim 17;

Miyoshi et al , Cioffi , Sands discloses all of the subject matter disclose above, but does not teach transmission input data is propagated from the transmitter site to the receiver site.

However, Amrany in the same field of endeavor, teaches wherein the transmission input data is propagated from the transmitter site to the receiver site (fig. 2A, col. 6, lines 38-44).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the teaching of Amrany to the system of Miyoshi et al, Cioffi and Sands in order to approximate the transmitted signal. The motivation to implement Amrany's method was to provide more accurate computation results.

(2) With regards to claim 18;

Miyoshi et al further discloses transmission input data is propagated from the receiver site to the transmitter site (col. 9, lines 21-26).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lui (US 2004/0096052 A1) discloses a method for frequency and loop length grouping for cross-talk reduction in a plurality of DSL channels.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helene Tayong whose telephone number is 571-270-1675. The examiner can normally be reached on Monday-Friday 7:30 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lui Shuwang can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Helene Tayong

5/14/07

SHUWANG LIU
SUPERVISORY PATENT EXAMINER